Licensable Technologies

Acoustic Microfluid Flow

Applications:

- Microfluid mixing
- Microfluid flow control
- Microfluid chemical "trapping"
- Microfluid separation

Benefits:

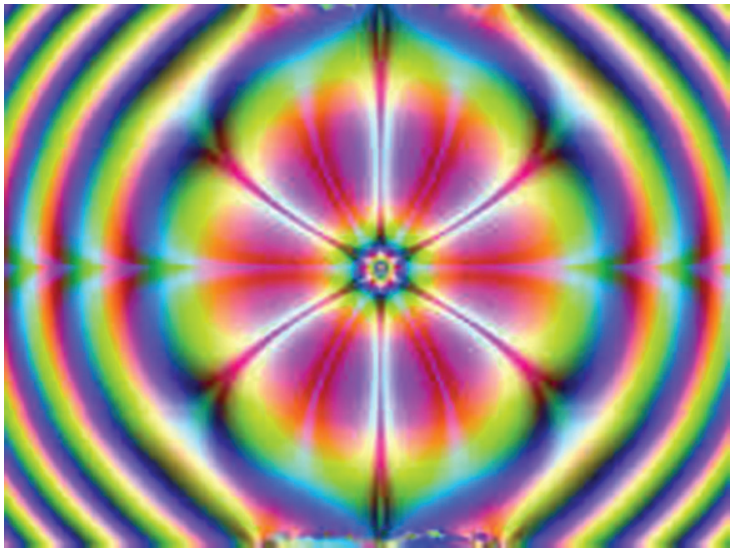
- Easy to implement—No MEMs or lithography are needed to create pumps.
- Inexpensive—Currently transducers are less than $10 each.
- Non-invasive—No mechanical contact with the microfluid is necessary. Contamination is a non-issue.
- High control—Acoustic control is sensitive and allows switching among flow, mixing, and separation modes simply by changing the acoustic wave.
- Flexibility—Acoustic controls may allow the same microfluid chambers to perform multiple functions.

Contact:

Laura Barber, 505-667-9266
ljbb@lanl.gov

tmt-2@lanl.gov

Technology Transfer Division



Summary:

Mixing is very difficult to achieve in microfluids. Los Alamos National Laboratory scientists have discovered a noninvasive way to mix microfluids amenable to "lab-on-a-chip" settings. Our method uses small acoustic sources to control the mixing, separation, and flow of microfluids. Our acoustic controls require no lithography or MEMs (micro-electro-mechanical systems)-type construction. Instead, we control microfluid control using inexpensive transducers that have the added advantage of being noninvasive and thus both sterile and reusable.

By changing the frequency, amplitude, and waveform, acoustic controls can control flow rates, set up stationary patters as chemical traps and switch microfluid flow on and off. Chaotic mixing can be induced by generating microturbulence, which may lead to more sensitive sensing when reactions must be detected.

Our acoustic microcontrol systems may lead to much simpler, more effective, and less expensive microfluidic devices. Control of flow rates and mixing is efficient and sensitive.

Our acoustic microfluid controls also can assist in coating microspheres and nanoparticles by mixing these particles efficiently with electrochemical reagents.

Development Stage:

A working prototype has been developed.

Patent Status:

Patent pending.

Licensing Status:

Available for exclusive or non-exclusive licensing.

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